

Renhe Chen

Curriculum Vitae

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Education

- 2021–2024 **ShanghaiTech University**, *Master of Eng. candidate in Electrical Engineering*.
(Expected) **Thesis supervisor**: Prof. Xufeng Kou.
GPA: 3.77/4.0
Major Courses: Analog IC II(A+), Nano Processing(A+), Physics of Semiconductor Devices(A+)
- 2017–2021 **ShanghaiTech University**, *Bachelor of Eng. in Electrical Engineering*.
GPA: 3.71/4.0
Major Courses: Analog IC(A+), Digital IC(A+), Embedded Systems(A+), Electric Circuits(A)

Research Projects

- Apr. 2022 – **High performance analog-to-digital converter**, in ShanghaiTech University.
Present
 - Built a SAR ADC model including sampling jitter, thermal noise, mismatch and incomplete settling.
 - Proposed a gain-boosting dynamic comparator featuring a modified pre-amplifier.
 - Designed an asynchronous SAR logic maximizing CDAC settling time and has low circuit complexity.
 - Fabricated in 28-nm CMOS, set up circuit evaluation platform with dedicated PCB and FPGA control program.**Collaborator**: Prof. Hao Xu from Fudan University, Shanghai, China.
- Jun. 2022 – **Dynamic bias optimization circuit for MRAM**, in ShanghaiTech University.
Present
 - Quantified the optimal read bias voltage of MRAM cell, in reference with measured results.
 - Designed a dynamic bias optimization circuit (DBO) that can track the optimal read bias voltage in background, with respect to a wide range of process variation and thermal conditions.
 - Simulated the proposed DBO with 1-Mb MRAM array, using 28-nm PDK and Verilog-A MRAM model.**Collaborator**: Dr. Albert Lee from UCLA, CA, the US.
- Jul. 2020 – **Cryogenic circuit design and testing**, in ShanghaiTech University.
2021
 - Simulated CMOS circuit operation down to 10K using cryogenic compact model.
 - Implemented a 5-bit flash ADC using cryogenic modeled PDK.
 - Cryogenic circuit test and evaluation using liquid helium dewar and probe station.

Publications

- Journal publications
 - **R.Chen**, A. Lee, Z. Wang, D. Wu, X. Kou. "A Read Margin Enhancement Circuit with Dynamic Bias Optimization for MRAM." IEEE Transactions on Circuits and Systems II - Express Briefs (under review).
- Conference publications
 - **R.Chen**, A. Lee, H. Xu, Y. Hu, X. Kou. "A 12-bit 75 MS/s Asynchronous SAR ADC with Gain-Boosting Dynamic Comparator." IEEE International Symposium on Circuits and Systems (ISCAS), 2024 (under review).
 - Y Hu, Z Wang, **R.Chen**, Z Tang, A Guo, C Cao, W Wu, S Chen, Y Zhao, L Yu, G Shang, H Xu, S Hu, X Kou. "Cryo-CMOS Model-Enabled 8-Bit Current Steering DAC Design for Quantum Computing." IEEE International Symposium on Circuits and Systems (ISCAS), 2022.
 - Z Wang, C Cao, P Yang, Y Yuan, Z Tang, **R.Chen**, W Wu, X Luo, A Guo, L Yu, G Shang, Z Zhang, S Hu, X Kou. "Designing EDA-Compatible Cryogenic CMOS Platform for Quantum Computing Applications." IEEE Electron Devices Technology & Manufacturing Conference (EDTM), 2021.

Skills

Software	IC Design: Cadence Virtuoso, Synopsys Design Compiler, IC Compiler, Verdi, VCS, Formality Embedded system: Altium Designer, Xilinx Vivado, Keil uVision, NI Multisim Other: Silvaco TCAD, Tanner L'edit, Adobe Photoshop, Illustrator
Programming	Matlab, C/C++, Python, Rust, R
Instrument	oscilloscope, network analyzer, logic analyzer, signal source analyzer, cryogenic testing system, probe station
Language	Chinese (Native), English (Fluent, TOEFL iBT: 99), Japanese (Basic)

Work Experience

Jun. 2022 – Jan.2023	Internship as Analog IC Design Engineer, United Imaging, Shanghai
2021 Spring, 2021 Fall	Teaching Assistant of Digital Integrated Circuits I, ShanghaiTech University

Awards

2022	Outstanding Student, ShanghaiTech University
2019	Second Prize in Shanghai, National Undergraduate Electronics Design Contest
2019	First Prize in the north region, RoboMaster Robotics Competition
2019	Third Prize national, RoboMaster Robotics Competition
2018,2020	Excellent Academic Scholarship of SIST, ShanghaiTech University

Activities

2018-2019	Vice President of the School's Volunteers' Association, ShanghaiTech University
2017-2021	Vice President of the School's Modelers' Club, ShanghaiTech University
Jul. 2019	Museum Docent in Shanghai Science and Technology Museum
Jun. 2018, Jun. 2021	Volunteer of the Open Day, ShanghaiTech University